

### **REMARKS**

Claims 1, 3-8, 10-15, and 17 are all of the claims presently pending in the application. Claims 1, 8 and 15 have been amended to more particularly define the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 4-6 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 1-7 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Ishikawa et al. (U.S. Patent No. 6,116,055) (hereinafter "Ishikawa"). Claims 8, 10-15 and 17 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ishikawa in view of Antos et al. (U.S. Patent No. 6,289,698) (hereinafter "Antos").

These rejections are respectfully traversed in the following discussion.

#### **I. THE 35 USC §112, SECOND PARAGRAPH, REJECTION**

Claims 4-6 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants respectfully disagree with the Examiner's rejection.

The Examiner alleges that the subject matter of claims 4-6 is contradictory to the subject matter of claim 1. Applicants respectfully submit that claim 1 recites "said porous-glass material having an outer diameter (d) within a predetermined range, said predetermined range being determined based on an inner diameter (D) of said opening of said ring heater". Claim 1 establishes that the outer diameter of the porous-material is selected within a predetermined range. Claim 1 further defines the manner in which this predetermined range was determined. Claim 1 recognizes that the range of the outer diameter is determined based on an inner diameter of the opening of the ring heater.

Applicants submit that dependent claims 4 and 6 further define the basis for which the predetermined range was determined. Claim 4 recognizes that the predetermined range is determined based on the vertical length of the ring heater. Claim

6 recognizes that the predetermined range is determined so that an eccentricity of a core inside the glass base material manufactured by sintering the porous-glass material becomes substantially 0.4 % or less. Claims 4-6 merely further define the basis in which the predetermined range was determined.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

## II. THE PRIOR ART REFERENCES

### A. The Ishikawa Reference

The Examiner alleges that the claimed invention of claims 1-7 would have been obvious in view of Ishikawa. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by, nor would have been obvious in view of, Ishikawa.

That is, Ishikawa does not teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, including *“preparing the porous-glass material having an outer diameter (d) with a predetermined range, the predetermined range being determined based on an inner diameter (D) of the opening of the ring heater”* and *“putting the porous-glass material, formed by performing the preparing the porous-glass material, in the furnace”* as recited in claim 1, and similarly recited in claims 8 and 15.

The Examiner attempts to rely on column 3, lines 2-6 and column 4, lines 16-20 of Ishikawa to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in these passages (nor anywhere else for that matter) does Ishikawa teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, including preparing the porous-glass material having an outer diameter (d) with a predetermined range, the predetermined range being determined based on an inner diameter (D) of the opening of the ring heater and putting the porous-glass material, formed by performing the preparing the porous-glass material, in the furnace. Indeed, the Examiner does not even allege that Ishikawa teaches or suggests these features.

That is, the Examiner alleges that Ishikawa teaches a ring heater (24), through which a porous-glass material (21) passes, and that the porous-glass material is heated in an atmosphere of dehydration gas and inert gas.

The Examiner further alleges that “[i]t would have been obvious to prepare the heater, such as buying it, placing it in the furnace, or supplying power so as to heat it”. However, the Examiner has not provided a reference in support of these allegations. Further, even assuming, *arguendo*, that it would have been obvious to prepare the heater and place it in a furnace, Ishikawa does not teach or suggest preparing the porous-glass material having an outer diameter (d) within a predetermined range. By providing the porous-glass material within a predetermined range the claimed invention provides an effective method for sintering a porous-glass material. Specifically, the claimed invention is able to provide a glass material having lower eccentricity in a radial direction.

Moreover, Ishikawa does not teach or suggest that “*said predetermined range of said outer diameter (d) of said porous-glass material comprises substantially  $0.5xD \leq d \leq 0.9xD$* ” as recited in claim 1 and similarly recited in claims 8 and 15.

Indeed, the Examiner does not even allege that Ishikawa teaches the claimed range. The Examiner merely alleges that “[i]t would have been obvious to use as big or as small preform as desired - depending upon the amount of fiber that one desires” (see Office Action at page 4, lines 18-19). The Examiner further states “[i]t would have been obvious to make  $d/D$  as large as possible (and yet less than 0.93 (i.e., 0.9)) because the bigger  $d$ , the larger the preform, and thus the more fiber that one can make” (see Office Action at page 5 through page 6, line 2).

Applicants have discovered a specific range that achieves a specific result. The specific range recited in claim 1 allows the claimed invention to provide more effective sintering of a porous glass material, and more particularly allows the claimed invention to provide a glass base material having lower eccentricity in a radial direction.

Applicants point out that MPEP 2144.05 states that “[t]he law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims”. The claimed range recited in claim 1, and

similarly recited in claims 8 and 15, is important for achieving the desired results of the claimed invention. A specific range or other variable in a claim may provide patentable weight to a claim if the applicant can show that the particular range is important (see M.P.E.P. § 2144.05). In order to teach this claimed ratio, the specific limitation must be disclosed in the reference with “sufficient specificity to constitute an anticipation under the statute” (see M.P.E.P. § 2131.03). As stated above, Ishikawa does not teach or suggest the specific range recited in claim 1 and similarly recited in claims 8 and 15.

Furthermore, Applicants submit that the MPEP provides that “[a] particular parameter must first be recognized as a result-effective variable, i.e., **a variable which achieves a recognized result**, before the determination of the optimum or workable range of said variable might be characterized as routine experimentation” (MPEP at §2144.05) (emphasis added). Here, the cited references do not suggest any result as being affected by the outer diameter of the porous-glass material, let alone for optimizing a size of the outer diameter for providing the desired results of the claimed invention.

The claimed invention recognizes that if the outer diameter of the porous-glass material is smaller than  $0.5 \times D$ , then the porous-glass material is sintered inside of the furnace where the temperature gradient in the radial direction of the furnace is large. Thus, the porous-glass material may be vitrified non-uniformly in the radial direction, and therefore the eccentricity of the core inside of the glass base material increases (see Application at page 9, lines 24-33). An increase in the eccentricity of a core causes a serious defect in the glass base material product so that the manufactured glass base material cannot be used as a product (see Application at page 10, lines 6-8).

Additionally, the claimed invention recognizes that if the outer diameter of the porous-glass material is larger than  $0.9 \times D$ , the porous-glass material may contact with the sidewall of the furnace and may be damaged during the sintering process (see Application at page 10, lines 10-14).

Nowhere does Ishikawa teach or suggest that the outer diameter of the porous-glass material may have any effect on the eccentricity of the core inside of the glass base material. Certainly, Ishikawa does not teach or suggest that the outer diameter of the porous-glass material may be chosen to lower the eccentricity of a glass base material in

a radial direction. Therefore, it is clearly unreasonable to suggest that Ishikawa teaches or suggests that the outer diameter of the porous-glass material is merely a result effective variable.

Thus, the specific range recited in exemplary claim 1 (and similarly recited in claims 8 and 15) clearly shows a technical effect and is not arbitrarily selected to solve the problems presented in the Application.

Therefore, Applicants submit that claimed invention recites features that are not obvious in view of Ishikawa. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

#### **B. The Antos Reference**

The Examiner alleges that Antos would have been combined with Ishikawa to form the claimed invention of claims 8, 10-15 and 17. Applicants submit, however, that these references would not have been combined and that, even if combined, the alleged combination would not teach or suggest each and every feature of the claimed invention.

Indeed, these references are directed to different problems and solutions. Specifically, Ishikawa is directed to a process of thermal treatment for the stable production of an optical fiber preform for a long period from which preform an optical fiber having a low transmission loss can be drawn (see Ishikawa at column 2, lines 3-7), whereas Antos is merely directed to a method of reducing the occurrence of bubbles in optical fiber draw blanks (see Antos at column 3, lines 3-8). Therefore, these references are completely unrelated, and a person of ordinary skill in the art, attempting to improve Ishikawa, would have no reasonable motivation to consult the disparate reference Antos, absent impermissible hindsight.

Furthermore, the Examiner's motivation to modify Ishikawa ("to remove any remaining bubbles") is not a problem in Ishikawa that would require a solution. Thus, as pointed out in MPEP 2143.01, the Examiner's motivation is "improper". That is, "the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (emphasis in MPEP itself).

Moreover, neither Ishikawa nor Antos, nor any combination thereof, teaches or suggests a method for sintering a porous glass-material having a core inside the porous-glass material, including “*preparing the porous-glass material having an outer diameter (d) with a predetermined range, the predetermined range being determined based on an inner diameter (D) of the opening of the ring heater*” and “*putting the porous-glass material, formed by performing the preparing the porous-glass material, in the furnace*” as recited in claim 1, and similarly recited in claims 8 and 15.

The Examiner attempts to rely on column 4, lines 5-34 of Antos to support his allegations.

Nowhere, however, in this passage (nor anywhere else for that matter) does Antos teach or suggest a method for sintering a porous glass-material having a core inside the porous-glass material, including preparing the porous-glass material having an outer diameter (d) with a predetermined range, the predetermined range being determined based on an inner diameter (D) of the opening of the ring heater and putting the porous-glass material, formed by performing the preparing the porous-glass material, in the furnace. Indeed, the Examiner does not even allege that Antos teaches or suggests these features. The Examiner merely relies upon Antos as teaching that it is known to stretch preforms to reduce bubbles. Thus, Antos fails to make up for the deficiencies of Ishikawa.

Moreover, neither Antos nor Ishikawa, nor any combination thereof, teaches or suggests that “*said predetermined range of said outer diameter (d) of said porous-glass material comprises substantially  $0.5xD \leq d \leq 0.9xD$* ” as recited in claim 1 and similarly recited in claims 8 and 15.

Therefore, Applicants respectfully submit that these references would not have been combined as alleged by the Examiner and that, even if combined, the alleged combination of features does not teach or suggest each and every feature of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection.

### **III. FORMAL MATTERS AND CONCLUSION**

In response to the Examiner's objections to the claims, Applicants respectfully submit that dependent claims 4 and 6 further define the basis for which the predetermined range was determined. Claim 4 recognizes that the predetermined range is determined based on the vertical length of the ring heater. Claim 6 recognizes that the predetermined range is determined so that an eccentricity of a core inside said glass base material manufactured by sintering said porous -glass material becomes substantially 0.4 % or less. Claims 4-6 merely further define the basis in which the predetermined range was determined.

In view of the foregoing, Applicants submit that claims 1, 3-8, 10-15 and 17, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.


Serial No. 09/987,404  
Docket No. SH-0027US

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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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A handwritten signature in dark ink, appearing to read 'S. Tulino', is written over a horizontal line.

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